Journal of Aerosol Science

J. Aerosol Sci.

An International Journal

In association with the Gesellschaft für Aerosolforschung

VOLUME CONTENTS AND AUTHOR INDEX

VOLUME 17, 1986

VOL.
17
1986

Pergamon Press *Oxford* *New York*

Beijing *Frankfurt* *São Paulo* *Sydney* *Tokyo* *Toronto*

JOURNAL OF AEROSOL SCIENCE

In association with the Gesellschaft für Aerosolforschung (GAeF)
Association for Aerosol Research

Founding Editor Prof. C. N. DAVIES

Editorial Board

Dr. D. HOCHRAINER, *Editor-in-Chief, Fraunhofer-Institut, D-5948 Schmallenberg, W. Germany*
Dr. M. M. BENARIE, *Associate Editor, Environmental Consultant, 12, rue de l'Yveline, 91220, Bretigny, France*
Prof. J. R. BROCK, *Associate Editor, Dept. of Chemical Engineering, University of Texas at Austin, Austin, TX 78712, U.S.A.*
Prof. V. PRODI, *Associate Editor, Dipartimento di Fisica, Universita degli Studi di Bologna, Via Irnerio 46, I-40126, Bologna, Italy*
Dr. M. ANISIMOV, *Institute of Coal of SB AS USSR, Sovetsky Prospect 18, 650099 Kemerovo, U.S.S.R.*
Prof. J. BRICARD, *Professeur à la Faculté des Sciences de Paris, 9 bis, Rue de Moscou, F-75008, Paris, France*
Prof. I. GALLILY, *Department of Atmospheric Sciences, The Hebrew University of Jerusalem, Jerusalem, Israel 91904*
Dr. J. GEBHART, *Gesellschaft für Strahlen- und Umweltforschung, Paul-Ehrlich-Str. 20, D-6000 Frankfurt/Main, W. Germany*
Prof. W. C. HINDS, *Environmental and Occupational Health Sciences, School of Public Health, University of California, Los Angeles, CA 90024, U.S.A.*
Dr. D. B. INGHAM, *School of Mathematics, University of Leeds, Leeds LS2 9JT, U.K.*
Dr. G. KASPER, *Liquid Air Corporation, Technology Center, 5230 S. East Avenue, Countryside, IL 60525, U.S.A.*
Prof. Y. KOUSAKA, *Department of Chemical Engineering, College of Engineering, University of Osaka Prefecture, Mozu-Umemachi, Sakai, Osaka 591, Japan*
Dr. J. P. LODGE, Jr., 385 *Broadway, Boulder, CO 80303, U.S.A.*
Prof. J. MEGAW, *Department of Physics, York University, 4700 Keele Street, Downsview, Toronto M3J 1P3, Canada*
Dr. U. C. MISHRA, *Head, Air Monitoring Section, Bhabha Atomic Research Section, Trombay, Bombay 400 085, India*
Dr. JOSEF PICH, *J. Heyrovski Institute of Physical and Electrochemistry, 11000 Prague-1-Opletalova 25, Czechoslovakia*
Prof. O. PREINING, *Institut für Experimentalphysik der Universität Wien, Strudlhofgasse 4, A-1090 Wien, Austria*

Executive Board of the GAeF

Prof. Dr. O. PREINING, *President, Institut für Experimentalphysik der Universität Wien, Strudlhofgasse 4, A-1090 Wien, Austria*
Prof. W. SCHIKARSKI, *Vice-President, Kernforschungszentrum Karlsruhe, Laboratorium für Aerosolphysik und Filtertechnik, Postfach 3640, D-7500 Karlsruhe 1, W. Germany*
Dr. B. GEORGI, *Secretary General, Niedersächsisches Institut für Radioökologie an der Universität Hannover, Herrenhäuser Straße 2, D-3000 Hannover 21, W. Germany*
Dr. C. HELSPER, *Palas GmbH, Haid-und-Neu-Straße 7–9, D-7500 Karlsruhe 1, W. Germany*
Dr. J. HEYDER, *Gesellschaft für Strahlen- und Umweltforschung, Paul-Ehrlich-Str. 20, D-6000 Frankfurt/Main, W. Germany*
Dr. D. HOCHRAINER, *Fraunhofer-Institut, D-5948 Schmallenberg, W. Germany*
Dr. W. HOLLÄNDER, *Fraunhofer-Institut ITA, Stadtfeldamm 35, D-3000 Hannover 61, W. Germany*
Dr. W. G. ISRAEL, *Technische Universität Berlin, Fachgebiet Luftreinhaltung-Sekr. KF 2, Straße des 17. Juni 135, D-1000 Berlin 12, W. Germany*
Prof. V. A. MARPLE, *University of Minnesota, Department of Mechanical Engineering, 111 Church Street S.E., Minneapolis, MN 55455, U.S.A.*
Dr. K. SPURNY, *Fraunhofer-Institut IUCT Grafschaft, D-5948 Schmallenberg, W. Germany*

Publishing and Advertising Offices: Headington Hill Hall, Oxford OX3 0BW, U.K.

Annual subscription rate (1987, *including postage and insurance*): Annual institutional subscription rate (1987) DM 610.00. 2 year institutional rate (1987/88) DM 1159.00. Personal subscription rate for those whose library subscribes at the regular rate (1987) DM 200.00. Prices are subject to change without notice. Subscription enquiries from customers in North America should be sent to Pergamon Journals Inc., Maxwell House, Fairview Park, Elmsford, NY 10523, U.S.A. and for the remainder of the world to Pergamon Journals Ltd., Headington Hill Hall, Oxford OX3 0BW, U.K. Published bi-monthly. Members of GAeF receive the journal as part of their membership dues. Details on membership of the Association can be obtained from: Dr. B. Georgi, Tel.: (0511) 7623284.

Copyright © 1986 Pergamon Journals Ltd.

It is a condition of publication that manuscripts submitted to this journal have not been published and will not be simultaneously submitted or published elsewhere. By submitting a manuscript, the authors agree that the copyright for their article is transferred to the publisher if and when the article is accepted for publication. However, assignment of copyright is not required from authors who work for organizations which do not permit such assignment. The copyright covers the exclusive rights to reproduce and distribute the article, including reprints, photographic reproductions, microform or any other reproductions of similar nature and translations. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, electrostatic, magnetic tape, mechanical, photocopying, recording or otherwise, without permission in writing from the copyright holder.

Photocopying information for users in the U.S.A. The Item-fee Code for this publication indicates that authorization to photocopy items for internal or personal use is granted by the copyright holder for libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service provided the stated fee for copying, beyond that permitted by Section 107 or 108 of the United States Copyright Law, is paid. The appropriate remittance of $3.00 per copy per article is paid directly to the Copyright Clearance Center Inc., 27 Congress Street, Salem, MA 01970.

Permission for other use. The copyright owner's consent does not extend to copying for general distribution, for promotion, for creating new works, or for resale. Specific written permission must be obtained from the publisher for such copying.

The Item-fee Code for this publication is: 0021–8502/86 $3.00 + 0.00

Microform Subscriptions and Back Issues. Back issues and all previously published volumes are available in the regular editions and on microfilm and microfiche. Current subscriptions are available on microfiche simultaneously with the paper edition and on microfilm on completion of the annual index at the end of the subscription year.

PERGAMON JOURNALS

HEADINGTON HILL HALL,
OXFORD OX3 0BW

MAXWELL HOUSE, FAIRVIEW PARK,
ELMSFORD, NY 10523

CONTENTS

NUMBER 1

A. GREKULA, E. RISTOLAINEN, V. P. TANNINEN, H-K. HYVÄRINEN and P-L. KALLIOMÄKI — 1 Surface and bulk chemical analysis on metal aerosols generated by manual metal arc welding of stainless steel

J. R. BROCK, P. J. KUHN and D. ZEHAVI — 11 Condensation aerosol formation and growth in a laminar coaxial jet: experimental

J. ROSINSKI, P. L. HAAGENSON, C. T. NAGAMOTO and F. PARUNGO — 23 Ice-forming nuclei of maritime origin

H. BURTSCHER, A. REIS and A. SCHMIDT-OTT — 47 Particle charge in combustion aerosols

W. D. GRIFFITHS and N. P. VAUGHAN — 53 The aerodynamic behaviour of cylindrical and spheroidal particles when settling under gravity

W. C. HINDS and G. KRASKE — 67 Performance of PMS model LAS-X optical particle counter

G. E. SHAW — 73 On the physics of Aitken particles in polar air mass systems

M. BARBE-LE BORGNE, D. BOULAUD, G. MADELAINE and A. RENOUX — 79 Experimental determination of the dynamic shape factor of the primary sodium peroxide aerosol

YU. V. JULANOV, A. A. LUSHNIKOV and I. A. NEVSKII — 87 Statistics of multiple counting in aerosol counters—II. Concentration counters

C. M. BANIC and J. V. IRIBARNE — 95 Observation of ion clusters in ion-induced NH_4Cl nucleation

107 Reports

109 Review

111 Announcements

NUMBER 2

W. SCHIKARSKI — 113 Professor Harald Straubel's eightieth birthday

S.-Y. HWANG, J. W. GENTRY and S. W. DAVISON — 117 Unipolar charging of ultrafine aerosols

J. C. BARRETT and C. F. CLEMENT — 129 A soluble one-dimensional problem for coupled heat conduction and mass diffusion with aerosol formation in a vapour–gas mixture

I. OWEN, A. A. EL-KADY and J. W. CLEAVER — 145 A note comparing the rates of deposition of sub-micron particles with the rates of heat transfer for ribbed surfaces exposed to turbulent gas streams

VOL. 17 1986

F. DÉSALMAND, R. SERPOLAY and J. PODZIMEK 149 General features of the aerosol observed in the Guinean savannah at the level of the ITCZ influence of the drought

G. KÖNIG, K. ANDERS and A. FROHN 157 A new light-scattering technique to measure the diameter of periodically generated moving droplets

P. S. K. LIU and W. J. MEGAW 169 Spread factors for oil-based and water droplets

M. J. CAMPBELL, D. R. CRONN and W. L. BAMESBERGER 179 A modified commercial electrostatic aerosol analyzer for size distribution measurements of condensing aerosols in hot, wet stack gases

T. BAHNERS and E. SCHOLLMEYER 191 Computer simulation of the filtration process in a fibrous filter collecting polydisperse dust

P. K. WANG 201 Brownian diffusion of charged fine particles surrounding a conducting cylinder in the presence of an external electric field

J. H. VINCENT, D. C. STEVENS, D. MARK, M. MARSHALL and T. A. SMITH 211 On the aspiration characteristics of large-diameter, thin-walled aerosol sampling probes at yaw orientations with respect to the wind

E. O. KNUTSON 225 A salute to David Sinclair on his retirement from duty with the environmental measurements laboratory

227 Book Reviews

228 Announcements

NUMBER 3

Special Issue: Aerosols in Science, Medicine and Technology

Opening address:

Prof. Dr. W. SCHIKARSKI, President of the Association for Aerosol Research (GAeF) 229

1. *Atmospheric Aerosol*

R. SLADKOVIC, R. REITER and K. PÖTZL: Chemical components of the atmospheric aerosol at a high mountain station as a function of temporal trend and meteorological parameters, based on a 13-year measuring series 231

S. K. FRIEDLANDER, J. R. TURNER and S. V. HERING: A new method for estimating dry deposition velocities for atmospheric aerosols 240

E. THOMALLA, H. KREMSER, P. KOEPKE and H. QUENZEL: Aerosol size distribution and aerosol optical depth at a savannah in the south-west of Africa: Results of optical measurements 245

G. A. D'ALMEIDA and P. KOEPKE: Space and time distribution of tropospheric aerosol optical properties 249

P. KOEPKE and M. HESS: Nonspherical particles and their influence on the scattering function of tropospheric aerosols 254

H. HORVATH, J. JÄGER, I. KREINER and C. NOREK: Determination of the size-dependent light absorption coefficient of aerosols 258

L. HELMES and R. JAENICKE: Atmospheric turbidity determined from sunshine records 261

G. Poss, C. Weiland and G. Metzig: First experiences with a set of chemical analyses of tropospheric aerosol within the POETA program 264
T. Raunemaa, M. Olin, M. Hannikainen, M. Kulmala and A. Hautojärvi: Measurements and interpretation of indoor aerosol radioactivity by a microcomputer system 268
Chr. Voigts, G. Siegmon, M. Berndt and W. Enge: Single alpha-emitting aerosol particles 271
J. Müller: Invariant properties of the atmospheric aerosol 277
W. Behnke, F. Nolting and C. Zetzsch: A smog chamber study on the impact of aerosols on the photodegradation of chemicals in the troposphere 283
K. Wengenroth, H. W. Bauer, G. W. Israël and K. M. Winnen: Sulfate formation and related particle size distribution during a winter smog alert 285
H.-U. Pfeffer and M. Buck: Measurement of suspended particulates in the air in Northrhine–Westphalia. Comparison between the radiometric instrument FH 62 I and the LIB-method 290
G. de Leeuw: Size distributions of giant aerosol particles close above sea level 293
H.-W. Bauer and G. W. Israël: Einsatzfähigkeit von automatisierten Meßgeräten zur überwachung der Schwebstaubkonzentration 297
H. Horvath, J. Gorraiz and G. Raimann: The influence of the atmospheric aerosol on the visibility of black and colored targets 301
E. Vrins, P. Hofschreuder, W. M. ter Kuile, R. van Nieuwland, F. Oeseburg and P. Alderliesten: Atmospheric influences on the sampling efficiency of aerosol samplers for large windborne particles 302
R. Hitzenberger: The behaviour of the atmospheric aerosol scattering coefficient under varying meteorological conditions 303
M. J. Rood, T. V. Larson, D. S. Covert and A. P. Waggoner: Optical detection of metastable ambient aerosols 304

2. *Health and Environmental Effects of Aerosols*

A. P. Wehner: Biological effects and fate of inhaled man-made and natural aerosols in animal models 305
T. B. Martonen and F. J. Miller: Dosimetry and species sensitivity: Key factors in hazard evaluation using animal exposure data 316
G. Oberdörster, M. J. Utell, P. E. Morrow, R. W. Hyde, D. A. Weber and S. R. Drago: Decreased lung clearance of inhaled ^{99m}Tc-DTPA aerosols after NO_2 exposure: Indication of lung epithelial permeability change? 320
E. Drosselmeyer, H. L. Müller, S. Pickering and A. Seidel: Indium-doped aluminum oxide as a non-radioactive test aerosol for inhalation experiments 324
Ch. F. Schiller, J. Gebhart, J. Heyder, G. Rudolf and W. Stahlhofen: Factors influencing total deposition of ultrafine aerosol particles in the human respiratory tract 328
W. Stahlhofen, J. Gebhart, G. Rudolf and G. Scheuch: Measurement of lung clearance with pulses of radioactively-labelled aerosols 333
G.-F. Gerlach, H. Creutzig, B. Franz and K. Petzoldt: Radiolabeling of *Erysipelothrix rhusiopathiae* bacteria for inhalation studies in piglets 337
B. Bellmann, H. König, H. Muhle and F. Pott: Chemical durability of asbestos and of man-made mineral fibres *in vivo* 341
H. Muhle and B. Bellmann: Pulmonary clearance of inhaled particles in dependence of particle size 346
G. Rudolf, J. Gebhart, J. Heyder, Ch. F. Schiller and W. Stahlhofen: An empirical formula describing aerosol desposition in man for any particle size 350
N. H. Seemayer, N. Manojlovic and R. Tomingas: Induction of malignant cell transformation *in vitro* by extract and fractions of airborne particulate matter 356

VOL. 17 1986

S. Takenaka, H. Dornhöfer-Takenaka and H. Muhle: Alveolar distribution of fly ash and of titanium dioxide after long-term inhalation by Wistar rats 361
H. Schleibinger and H. Rüden: Mutagenicity of fractionated organic extracts derived from suspended particulate matter 365
A. Taya, G. Hotz and A. Seidel: Biochemical and electron microscopic studies on binding and transport of americium and plutonium hydroxide polymers in bovine alveolar macrophages and rat lungs 370
R. Jonas and K. Heinemann: Field experiments for studying the deposition of aerosols onto vegetation and other surfaces 376
S. Eskola: Deposition to forest—model calculations 382
J. N. Pritchard, S. J. Jefferies and A. Black: Sex differences in the regional deposition of inhaled particles in the 2.5–7.5 μm size range 385

3. *Physics and Chemistry of Aerosols*

E. M. Krushkal and I. Gallily: Cloud dynamics of non-spherical aerosol particles: The orientation distribution function 391
E. Straubel and H. Straubel: Optical observations of physical and chemical changes taking place during melting of freely suspended solid particles 392
G. O. Rubel and J. W. Gentry: Onset of particle crystallization resulting from acid droplet ammonia gas reactions 397
S. Jordan, H.-R. Paur, W. Cherdron and W. Lindner: Physical and chemical properties of the aerosol produced by the ES-Verfahren 400
M. Garmy and R. Serpolay: An isothermal diffusion tube for getting low-supersaturation spectra of CCN by coupling with a POLYTEC HC-15 spectrogranulometer 401
K. Blum and H. J. Fissan: Investigations of scattered light intensity distributions for determination of particle size distribution parameters 406
K. T. Mehta and H. S. Shah: A simplified method for estimation of light scattering parameters of aerosols 410
A. Wiedensohler, E. Lütkemeier, M. Feldpausch and C. Helsper: Investigation of the bipolar charge distribution at various gas conditions 413
J. C. Barrett and C. F. Clement: A soluble one-dimensional problem for coupled heat conduction and mass diffusion with aerosol formation in a vapour–gas mixture 417
C. Kaplan, J. Wang and J. W. Gentry: Condition numbers, Monte Carlo simulations and filter clogging 418
J.-S. Chang: Theory of aerosol particle thermal deposition on an arbitrarily shaped body 423
D. L. Johnson: Aerodynamic behavior of non-spherical, orthotropic aerosols under viscous settling conditions 426
W. D. Griffiths and N. P. Vaughan: The aerodynamic behaviour of cylindrical and spheroidal particles when settling under gravity 431
G. Scheuch and J. Heyder: Diffusional losses of nonspherical particles in tubes 432
C. Malherbe, D. Boulaud and A. Boutier: Etude de la turbulence induite par un champ acoustique 436
H-P. Baumgartner and F. Löffler: The collection performance of electret filters in the particle size range 10 nm–10 μm 438
R. Lathrache, H. J. Fissan and S. Neumann: Deposition of submicron particles on electrically charged fibers 446
K. R. Spurny: On the filtration of fibrous aerosols 450
H. Burtscher and A. Schmidt-Ott: *In situ* measurement of adsorption and condensation of a polyaromatic hydrocarbon on ultrafine C particles by means of photoemission 456

R. NIESSNER: The chemical response of the photoelectric aerosol sensor (PAS) to different aerosol systems 457
O. BRANDT, A. M. RAJATHURAI and P. ROTH: First observations on dispersive destruction of particle agglomerates in shock waves 458

4. *Ultrafine Aerosols*

R. STREY, T. SCHMELING and P. E. WAGNER: Strong reduction of homogeneous nucleation rates in associating vapors caused by the heat of oligomer formation 459
R. STREY, P. E. WAGNER and T. SCHMELING: Experimental nucleation rates of the *n*-alcohols in comparison with theory 462
A. MAJEROWICZ and P. E. WAGNER: Brownian coagulation of atmospheric aerosols in the presence of nucleation mode aerosol sources 463
F. RAES, A. JANSSENS and R. VAN DINGENEN: The role of ion-induced aerosol formation in the lower atmosphere 466
J. STEINWANDEL, J. HÖSCHELE and M. HAUSER: Kinetics of homogeneous condensation of nickel induced by thermal decomposition of $Ni(CO)_4$ behind shock waves 471
G. METZIG: Aerosol formation by SO_2-oxidation in the EVA flow tube reactor 474
C. ROTH: Generation of ultrafine gold aerosols 477
S. W. DAVISON, P. Y. YU, S. Y. HWANG and J. W. GENTRY: Experimental measurements of the rate of unipolar charging for spherical and non-spherical particles 481

5. *Aerosol Instrumentation*

B. STEEN: An acoustic method of measuring particle mass concentrations in gases 485
V. MARPLE, K. RUBOW, G. ANANTH and H. J. FISSAN: Micro-orifice uniform deposit impactor 489
T. B. MARTONEN and D. L. JOHNSON: On the motion of particles in centrifugal aerosol spectrometers: Theory and experiment 495
W. KOCH, H. LÖDDING, G. OENNING and H. MUHLE: The generation and the measurement of dry aerosols in large-scale inhalation experiments 499
W. HOLLÄNDER, R. BRANDT, E. PAPE and M. PLACHKY: Aerosol mass determination with nuclear track filters from quartz crystals 505
E. KAUPPINEN, R. HILLAMO, J. RUUSKANEN, T. HAKKARAINEN and P. ROUHIAINEN: Theoretical and experimental study of particle collection characteristics of high-velocity multijet cascade impactors 506
N. G. BERNIGAU and H. O. LUCK: The principle of the ionization chamber in aerosol measurement techniques—a review 511
K. LARJAVA and E. KAUPPINEN: Development of the volatile metal aerosol sampler based on vaporization/condensation 516
G. KUBIE: Detection of condensation nuclei by Aitken procedure using semiconductor image storage 520
W. SCHÖCK and V. VRANGOS: Calorimetric measurement of water fog mass concentration 525
E. F. AHARONSON, N. KARASIKOV, M. ROITBERG and J. SHAMIR: Galai-CIS-1—a novel approach to aerosol particle size analysis 530
H. BÜTTNER: Investigation on particle collection in small cyclones 537
R. HENKELMANN, F. BAUMGÄRTNER, K. KREBS and O. PETZOLDT: Determination of the retention efficiency of industrial air filters for particle sizes in the submicron range 542
P. BOESCH: Correction of cross-sensitivity and distribution curves 543
L. ARMBRUSTER, H. HEJNY and R. NIESSNER: Development of a low-volume aerosol sampling unit 546

VOL. 17 1986

D. KLOCKOW, R. NIESSNER and B. DÄUMER: Design and calibration of a low volume fog sampler 547
J. MACHER, E. HENNINGSON and I. FÄNGMARK: Efficiency testing of a sampler for microbiological aerosols 548
A. JÄPPINEN, H. KOVEROLA, M. KULMALA, T. RAUNEMAA and T. HÄKKINEN: Size distribution above 0.6 μm aerodynamic size of the aerosols produced by Spira respirator 552
J. P. MITCHELL and S. WATERS: Improvements to the vibrating orifice aerosol generator (VOAG) for the production of methylene blue particles 556
J. M. VANHEE, D. BOULAUD, G. MADELAINE and A. RENOUX: Production d'aérosols monodispersés de DOP à l'aide de la toupie tournante de May 561
M. DAHLBÄCK, O. NERBRINK, M. ARBORELIUS and H-C. HANSSON: Output characteristics from three medical nebulizers 563
V. DREILING, P. HALLER, C. HELSPER, U. KAMINSKI, A. PLOMP, F. RAES, C. ROTH, J. SCHIER and G. SCHUERMANN: Intercomparison of eleven condensation nucleus counters 565
R. HILLAMO and E. KAUPPINEN: Field evaluation of a high-volume industrial aerosol filter 571
I. FÄNGMARK, B. OLOFSSON and M. S. AHLBERG: Study of a simultaneous aerosol–vapor sampling method 575
V. PRODI, F. BELOSI and A. MULARONI: A personal sampler following ISO recommendations on particle size definitions 576
F. DE SANTIS, V. DI PALO and C. PERRINO: Accurate determination of inorganic ions in water-soluble particulate matter by coupling high efficiency diffusion and filtration techniques 582
A. VAN DER MEULEN, J. B. GOEDKOOP and B. G. VAN ELZAKKER: A simultaneous long path transmisso-nephelometer for the measurement of light-absorption by aerosols 583

6. *Industrial Aerosol Problems*

G. TARRONI, C. MELANDRI, T. DE ZAIACOMO, C. C. LOMBARDI and M. FORMIGNANI: Characterization of aerosols produced in cutting steel components and concrete structures by means of a laser beam 587
H. D. SEEHARS, D. HOCHRAINER and M. SPIEKERMANN: Particle properties of a nitric solution of cerium nitrate as a substitute of Pu-nitrate 592
E. KAUPPINEN, K. LARJAVA and R. HILLAMO: Mass and metal size distributions of municipal waste combustion aerosols 597
S. PICKERING: A mechanism for the resuspension of particles from burning plexiglas 602
G. SIEGMON, M. BERNDT, R. BEAUJEAN and W. ENGE: Generation of source-specific signature-classes of aerosol particles with EDAX 608
H. BUNZ and R. DLUGI: Studies on aerosol behavior in smog chambers: A parameter study with a numerical model combining aerosol physical processes and chemical reactions 612
M. BERNDT, G. SIEGMON and W. ENGE: Ion lithography on aerosol particles 618
J. HAUTANEN, K. JANKA, J. KESKINEN, M. LEHTIMÄKI and T. KIVISTÖ: Optimization of filtration efficiency and ozone production of the electrostatic precipitator 622
M. CIONI and L. BONFANTI: Characterization of solid emissions from a coal-fired power plant 627
M. KULMALA, V. RIIHILUOMA and T. RAUNEMAA: Particle emission from gasoline powered vehicles: Emission and deposition under different traffic density situations 629
D. A. LUNDGREN: A measurement technique to quantitate fugitive dust emission from handling of granular products 632

Ir. H. Zeedijk: Polycyclic aromatic hydrocarbon concentrations in smoke aerosol of domestic stoves burning wood and coal 635
H. A. Claessens, L. G. D. Lammerts van Bueren and P. M. van de Ven: Extraction and determination of polycyclic aromatic hydrocarbons from domestic stove aerosol 639
H. Bartz, G. Schwientek and H. J. Fissan: Dynamics of aerosols during cooling processes in tube flows 643
J. Keskinen, K. Janka, M. Lehtimäki, G. Graeffe and V. Kulmala: Aerosol formation caused by electrostatic precipitator 647

Alphabetical List of Authors 651

NUMBER 4

R. A. Fjeld and A. R. McFarland — 653 Bipolar charging in the transition regime

S. Jordan, H.-R. Paur, W. Cherdron and W. Lindner — 669 Physical and chemical properties of the aerosol produced by the electron beam dry scrubbing of flue gas (ES-Verfahren)

R. Castillo — 677 An analysis of black aerosol found in two winter Atlantic coastal snow storms at Whiteface Mountain, New York

R. C. Brown — 685 A many-fibre theory of airflow through a fibrous filter—II: fluid inertia and fibre proximity

H. Burtscher and A. Schmidt-Ott — 699 *In situ* measurement of adsorption and condensation of a polyaromatic hydrocarbon on ultrafine C particles by means of photoemission

R. Niessner — 705 The chemical response of the photo-electric aerosol sensor (PAS) to different aerosol systems

F. Raes and A. Janssens — 715 Ion-induced aerosol formation in a H_2O–H_2SO_4 system—II. Numerical calculations and conclusions

R. V. Tompson and S. K. Loyalka — 723 Condensational growth of a spherical droplet: free molecular limit

D. C. Stevens — 729 Review of aspiration coefficients of thin-walled sampling nozzles

M. C. Subba Ramu and T. S. Muraleedharan — 745 Formation of aerosols in irradiated atmospheric air

Technical Note
J. Bigu — 753 Attachment of radon and thoron progeny to the surface of different materials

757 Book Review

759 Announcements

VOL. 17 1986

NUMBER 5

761 Editorial

G. N. LIPATOV, S. A. GRINSPUN, G. L. SHINGARYOV and A. G. SUTUGIN — 763 Aspiration of coarse aerosol by a thin-walled sampler

D. J. RADER and P. H. MCMURRY — 771 Application of the tandem differential mobility analyzer to studies of droplet growth or evaporation

S. SIMONS, M. M. R. WILLIAMS and J. S. CASSELL — 789 A kernel for combined Brownian and gravitational coagulation

R. GAWRONSKI and K. W. SZEWCZYK — 795 Inertial deposition of particles in the human branching airways

Y. S. CHENG, B. T. CHEN and H. C. YEH — 803 Size measurement of liquid aerosols

J. HEYDER, J. GEBHART, G. RUDOLF, C. F. SCHILLER and W. STAHLHOFEN — 811 Deposition of particles in the human respiratory tract in the size range 0.005–15 μm

H.-C. WANG — 827 Theoretical adhesion efficiency for particles impacting a cylinder at high Reynolds number

S. J. DUNNETT and D. B. INGHAM — 839 A mathematical theory to two-dimensional blunt body sampling

K. H. LEONG — 855 On the continuous operation of the vibrating orifice aerosol generator

W. HOLLÄNDER, E. PAPE, M. PLACHKY, P. VATER and R. BRANDT — 859 Aerosol mass determination with nuclear track filters from quartz crystals

A. REINEKING and J. PORSTENDÖRFER — 873 High-volume screen diffusion batteries and α-spectroscopy for measurement of the radon daughter activity size distributions in the environment

Technical Note
H. HORVATH — 881 Use of back up filters with impactors equipped with a critical orifice

885 Book Reviews

NUMBER 6

A. LECINSKI, J. ROSINSKI and T. C. KERRIGAN — 887 Mathematical technique for analyzing drop-freezing data

A. Oron and C. Gutfinger	903	On turbulent deposition of particles to rough surfaces
W. D. Griffiths, P. J. Iles and N. P. Vaughan	921	The behaviour of liquid droplet aerosols in an APS 3300
R. Henkelmann, F. Baumgärtner, K. Krebs and O. Petzoldt	931	Determination of the retention efficiency of industrial air filters for particle sizes in the submicron range
G. E. Shaw	937	On physical properties of aerosol at Ross Island, Antarctica
H. Y. Wen and G. Kasper	947	Counting efficiencies of six commercial particle counters
B. T. Chen and D. J. Crow	963	Use of an aerodynamic particle sizer as a real-time monitor in generation of ideal solid aerosols
M. Kulmala, V. Riihiluoma and T. Raunemaa	973	Particle emission from gasoline powered vehicles: emission, deposition and re-emission under different traffic density situations
M. J. Piel, C. L. Griffin and D. B. Yeates	985	A technique for measuring bronchial muco-ciliary clearance in unsedated dogs
	999	News Page
	1001	Smoluchowski Award (GAeF)
	1003	Thanks to Referees

VOL.
17
1986

AUTHOR INDEX

Aharonson, E. F. 530
Ahlberg, M. S. 575
Ananth, G. 489
Anders, K. 157
Arborelius, M. 563
Armbruster, L. 546

Bahners, T. 191
Bamesberger, W. L. 179
Banic, C. M. 95
Barbe-Le Borgne, M. 79
Barrett, J. C. 129, 417
Bartz, H. 643
Bauer, H.-W. 285, 297
Baumgartner, F. 542, 931
Baumgartner, H.-P. 438
Beaujean, R. 608
Behnke, W. 283
Bellmann, B. 341, 346
Belosi, F. 576
Berndt, M. 271, 608, 618
Bernigau, N. G. 511
Bigu, J. 753
Black, A. 385
Blum, K. 406
Boesch, P. 543
Bonfanti, L. 627
Boulaud, D. 79, 436, 561
Boutier, A. 436
Brandt, O. 458
Brandt, R. 505, 859
Brock, J. R. 11
Brown, R. C. 685
Buck, M. 290
Bunz, H. 612
Burtscher, H. 47, 456, 699
Buttner, H. 537

Campbell, M. J. 179
Cassell, J. S. 789
Castillo, R. 677
Chang, J.-S. 423
Chen, B. T. 803, 963
Cheng, Y. S. 803
Cherdron, W. 400, 669
Cioni, M. 627
Claessens, H. A. 639
Cleaver, J. W. 145
Clement, C. F. 129, 417
Covert, D. S. 304
Creutzig, H. 337
Cronn, D. R. 179
Crow, D. J. 963

D'Almeida, G. A. 249
Dahlback, M. 563
Daumer, B. 547
Davison, S. W. 117, 481
De Santis, F. 582
De Zaiacomo, T. 587
Desalmand, F. 149
Di Palo, V. 582
Dingenen, R. Van 466
Dlugi, R. 612
Dornhofer-Takenaka, H. 361
Drago, S. R. 320
Dreiling, V. 565
Drosselmeyer, E. 324
Dunnett, S. J. 839

El-Kady, A. A. 145
Elzakker, B. G. Van 583
Enge, W. 271, 608, 618
Eskola, S. 382

Fangmark, I. 548, 575
Feldpausch, M. 413
Fissan, H. J. 406, 446, 489, 643
Fjeld, R. A. 653
Formignani, M. 587
Franz, B. 337
Friedlander, S. K. 240
Frohn, A. 157

Gallily, I. 391
Garmy, M. 401
Gawronski, R. 795
Gebhart, J. 328, 333, 350, 811
Gentry, J. W. 117, 397, 418, 481
Gerlach, G.-F. 337
Goedkoop, J. B. 583
Gorraiz, J. 301
Graeffe, G. 647
Grekula, A. 1
Griffin, C. L. 985
Griffiths, W. D. 53, 431, 921
Grinspun, S. A. 763
Gutfinger, C. 903

Haagenson, P. L. 23
Hakkarainen, T. 506
Hakkinen, T. 552
Haller, P. 565
Hannikainen, M. 268
Hansson, H.-C. 563
Hauser, M. 471
Hautanen, J. 622
Hautojarvi, A. 268
Heinemann, K. 376
Hejny, H. 546
Helmes, L. 261
Helsper, C. 413, 565
Henkelmann, R. 542, 931
Henningson, E. 548
Hering, S. V. 240
Hess, M. 254
Heyder, J. 328, 350, 432, 811
Hillamo, R. 506, 571, 597
Hinds, W. C. 67
Hitzenberger, R. 303
Hochrainer, D. 592
Hofschreuder, P. 302
Hollander, W. 505, 859
Horvath, H. 258, 301, 881
Hoschele, J. 471
Hotz, G. 370
Hwang, S.-Y. 117, 481
Hyde, R. W. 320
Hyvarinen, H-K. 1

Iles, P. J. 921
Ingham, D. B. 839
Iribarne, J. V. 95
Israel, G. W. 285, 297

Jaenicke, R. 261
Jager, J. 258
Janka, K. 622, 647
Janssens, A. 466, 715
Jappinen, A. 552
Jefferies, S. J. 385
Johnson, D. L. 426, 495
Jonas, R. 376
Jordan, S. 400, 669
Julanov, Yu. V. 87

Kalliomaki, P-L. 1
Kaminski, U. 565
Kaplan, C. 418
Karasikov, N. 530
Kasper, G. 947
Kauppinen, E. 506, 516, 571, 597
Kerrigan, T. C. 887
Keskinen, J. 622, 647
Kivisto, T. 622
Klockow, D. 547
Knutson, E. O. 225
Koch, W. 499
Koepke, P. 245, 249, 254
Konig, G. 157
Konig, H. 341
Koverola, H. 552
Kraske, G. 67
Krebs, K. 542, 931
Kreiner, I. 258
Kremser, H. 245
Krushkal, E. M. 391
Kubie, G. 520
Kuhn, P. J. 11
Kulmala, M. 268, 552, 629, 973
Kulmala, V. 647

Lammerts van Bueren, L. G. D. 639
Larjava, K. 516, 597
Larson, T. V. 304
Lathrache, R. 446
Lecinski, A. 887
Leeuw, G. De 293
Lehtimaki, M. 622, 647
Leong, K. H. 855
Lindner, W. 400, 669
Lipatov, G. N. 763
Liu, P. S. K. 169
Lodding, H. 499
Loffler, F. 438
Lombardi, C. C. 587
Loyalka, S. K. 723
Luck, H. O. 511
Lundgren, D. A. 632
Lushnikov, A. A. 87
Lutkemeier, E. 413

Macher, J. 548
Madelaine, G. 79, 561
Majerowicz, A. 463
Malherbe, C. 436
Manojlovic, N. 356
Mark, D. 211
Marple, V. 489
Marshall, M. 211
Martonen, T. B. 316, 495
McFarland, A. R. 653
McMurry, P. H. 771
Megaw, W. J. 169
Mehta, K. T. 410
Melandri, C. 587
Metzig, G. 264, 474
Meulen, A. Van der 583
Miller, F. J. 316
Mitchell, J. P. 556
Morrow, P. E. 320
Muhle, H. 341, 346, 361, 499
Mularoni, A. 576
Muller, H. L. 324
Muller, J. 277
Muraleedharan, T. S. 745

Nagamoto, C. T. 23
Nerbrink, O. 563
Neumann, S. 446
Nevskii, I. A. 87
Niessner, R. 457, 546, 547, 705
Nieuwland, R. Van 302
Nolting, F. 283
Norek, C. 258

Oberdorster, G. 320
Oenning, G. 499
Oeseburg, F. 302
Olin, M. 268
Olofsson, B. 575
Oron, A. 903
Owen, I. 145

Pape, E. 505, 859
Parungo, F. 23
Paur, H.-R. 400, 669
Perrino, C. 582
Petzoldt, K. 337
Petzoldt, O. 542, 931
Pfeffer, H.-U. 290
Pickering, S. 324, 602
Piel, M. J. 985
Plachky, M. 505, 859
Plomp, A. 565
Podzimek, J. 149
Porstendorfer, J. 873
Poss, G. 264
Pott, F. 341
Potzl, K. 231
Pritchard, J. N. 385
Prodi, V. 576

Quenzel, H. 245

Rader, D. J. 771
Raes, F. 466, 565, 715
Raimann, G. 301
Rajathurai, A. M. 458
Raunemaa, T. 268, 552, 629, 973
Reineking, A. 873
Reis, A. 47
Reiter, R. 231
Renoux, A. 79, 561
Riihiluoma, V. 629, 973
Ristolainen, E. 1
Roitberg, M. 530
Rood, M. J. 304
Rosinski, J. 23, 887
Roth, C. 477, 565
Roth, P. 458
Rouhiainen, P. 506
Rubel, G. O. 397
Rubow, K. 489
Ruden, H. 365
Rudolf, G. 328, 333, 350, 811
Ruuskanen, J. 506

Scheuch, G. 333, 432
Schier, J. 565
Schikarski, W. 113, 229
Schiller, Ch. F. 328, 350, 811
Schleibinger, H. 365
Schmeling, T. 459, 462
Schmidt-Ott, A. 47, 456, 699
Schock, W. 525
Schollmeyer, E. 191
Schuermann, G. 565
Schwientek, G. 643
Seehars, H. D. 592
Seemayer, N. H. 356
Seidel, A. 324, 370
Serpolay, R. 149, 401
Shah, H. S. 410
Shamir, J. 530
Shaw, G. E. 73, 937
Shingaryov, G. L. 763
Siegmon, G. 271, 608, 618
Simons, S. 789
Sladkovic, R. 231
Smith, T. A. 211
Spiekermann, M. 592
Spurny, K. R. 450
Stahlhofen, W. 328, 333, 350, 811
Steen, B. 485
Steinwandel, J. 471
Stevens, D. C. 211, 729
Straubel, E. 392
Straubel, H. 392
Strey, R. 459, 462
Subba Ramu, M. C. 745
Sutugin, A. G. 763
Szewczyk, K. W. 795

Takenaka, S. 361
Tanninen, V. P. 1
Tarroni, G. 587
Taya, A. 370
Ter Kuile, W. M. 302
Thomalla, E. 245
Tomingas, R. 356
Tompson, R. V. 723
Turner, J. R. 240

Utell, M. J. 320

Vanhee, J. M. 561
Vater, P. 859
Vaughan, N. P. 53, 431, 921
Ven, P. M. van de 639
Vincent, J. H. 211
Voigts, Chr. 271
Vrangos, V. 525
Vrins, E. 302

Waggoner, A. P. 304
Wagner, P. E. 459, 462, 463
Wang, H.-C. 827
Wang, J. 418
Wang, P. K. 201
Waters, S. 556
Weber, D. A. 320
Wehner, A. P. 305
Weiland, C. 264
Wen, H. Y. 947
Wengenroth, K. 285
Wiedensohler, A. 413
Williams, M. M. R. 789
Winnen, K. M. 285

Yeates, D. B. 985
Yeh, H. C. 803
Yu, P. Y. 481

Zeedijk, Ir. H. 635
Zehavi, D. 11
Zetzsch, C. 283

VOL. 17 1986